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DENTATE AND RELATED STONE BIFACE POINTS FROM NORTHERN AUSTRALIA.

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ABSTRACT

The Kimberley spear point as a typological entity has always been problematical. A brief discussion on some types of ethnographic and prehistoric biface points from the Northern Territory and the Kimberley region of Western Australia seeks to clarify some of these problems. A hitherto unrecognised, but distinct, form of stone biface point with dentate margins from the Kimberley is described, and a clarification of terms used for margin treatment of stone points is presented.

KEYWORDS: stone points, biface, pressure flaking, margin treatment, Kimberley, northern Australia.

INTRODUCTION

In this paper we define terms used to describe the edge treatment of bifacially pressure-flaked stone points, and using these definitions we present a classification of some types of these artefacts found in northern and north western Australia. A previously undescribed point is illustrated and discussed.

To date, little regional and typological analysis of bifacially flaked point industries has been undertaken. Previous work has focussed mainly on possible differentiation of types among symmetrical unifacial points (Campbell and Noone 1943; Campbell 1960: 509-524; Mulvaney 1975: 319-221; McCarthy 1976: 42). The most noteworthy exceptions are the analysis of the points from Yarar shelter, Port Keats, undertaken by Flood (1970), Schrire's (1982) analysis of excavated material from five sites in the Alligator Rivers region of West Arnhem Land, and Allen and Barton's (1989) analysis and discussion of points from Ngarradj Warde Djobkeng in the same area. (Fig.1).

Flood (1970) analysed a point series excavated from Yarar rock shelter in the Northern Territory, separating them initially into unifacially trimmed and bifacially trimmed groups. Dortch (1977) reviewed the northern Australian occurrence of various unifacially flaked points and included a type he referred to as 'Kimberley backed points'(Dortch 1977: 117). Here, we concentrate on bifacially flaked points, especially those which are invasivcly flaked using pressure techniques.

Three terms are used to describe specialized margin treatment that may occur on pressure flaked points:

dentate, describes a margin with more-or-less regularly spaced projections or teeth separated by notches that are wider than the teeth;

denticulate, describes regularly spaced projections which are separated by notches that are of similar width or narrower than the teeth themselves; and

serrated, which refers to extremely small or fine projections usually triangular in outline and separated from each other by equally fine notches.

Throughout the Kimberley Aboriginal language groups, the terms used for these three types of projection can be glossed as "teeth". To produce each "tooth" on a dentate margin, the knapper must remove a series of flakes from the embayment between the projections. These small flakes are removed from both faces of the artefact and produce scars which are long and

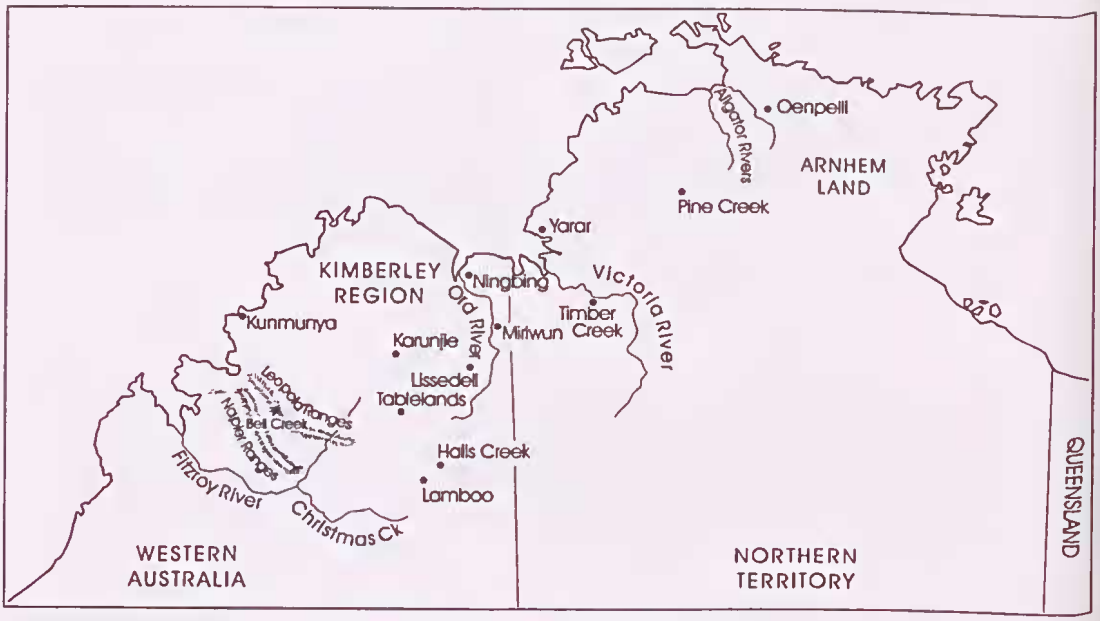

Fig. 1. Northern and north western Australia showing localities mentioned in the text.

shallow. The finished margin thus presents, in plan, a series of rectangular gaps which separate sub-rectangular projections. Flakes forming this edge are most invasive towards the longitudinal axis of the point, and the abrupt or steeper sides of each projecting tooth are shaped by crushing the brittle margins that remain after removal of the invasive flakes.

Projections on a denticulate margin are relatively smaller than those on the dentate margin, even though the completed artefacts may be of similar size and proportion. Usually the pressure flakes which produce the embayment between the projections are removed bifacially from the margin and more or less perpendicular to the central axis of the point.

Serrations usually protrude less than 2 mm from the body of the artefact. As a result of the overlapping flake scars produced when notching, serrations are often triangular in plan with pointed apices.

NORTHERN AUSTRALIAN BIFACE POINTS

Two basic but distinctive forms of bifacially flaked points were made in the ethnographic present in northern Australia, and two other distinctive types are seemingly prehistoric. The two ethnographic points are the Wanji Biface (Wanji Point) and the Kimberley Point, while the two prehistoric point types have yet to be named in the literature. For convenience, the first prehistoric point type we describe will be called the Northern Territory Triangular Point, the second prehistoric point type is described in detail and given the name Kimberley Dentate Point.

The Wanji Biface. In western Arnhem Land and adjacent areas to the west and south-west, the Wanji Biface (McCarthy 1976:44) was made until very recently. This point is made by percussion flaking of fissile materials such as indurated slate or other rocks possessing cleavage planes (Fig. 2). Large glass points (> 14 cm in length) made from plate glass or from the flat sides of square faced spirits bottles are associated with Wanji Points and apparently are a post-contact manifestation of the stone prototypes. These glass examples do not exhibit invasive pressure flaking. The chipping, which may be done either by percussion or pressure and removes only short flakes, has been applied to provide plan symmetry to the artefact, but margins are rarely as acute as the margins of points from the Kimberley. When found hafted, these glass points are invariably mounted directly into single-piece bamboo shafts with beeswax cement and a fibre cord binding, rather than being resin mounted on the composite shafts typical of the Kimberley spears. We suggest that these glass points are derived from the stone Wanji Points and are not related to the pressure flaked serrated glass points of the Kimberley region.

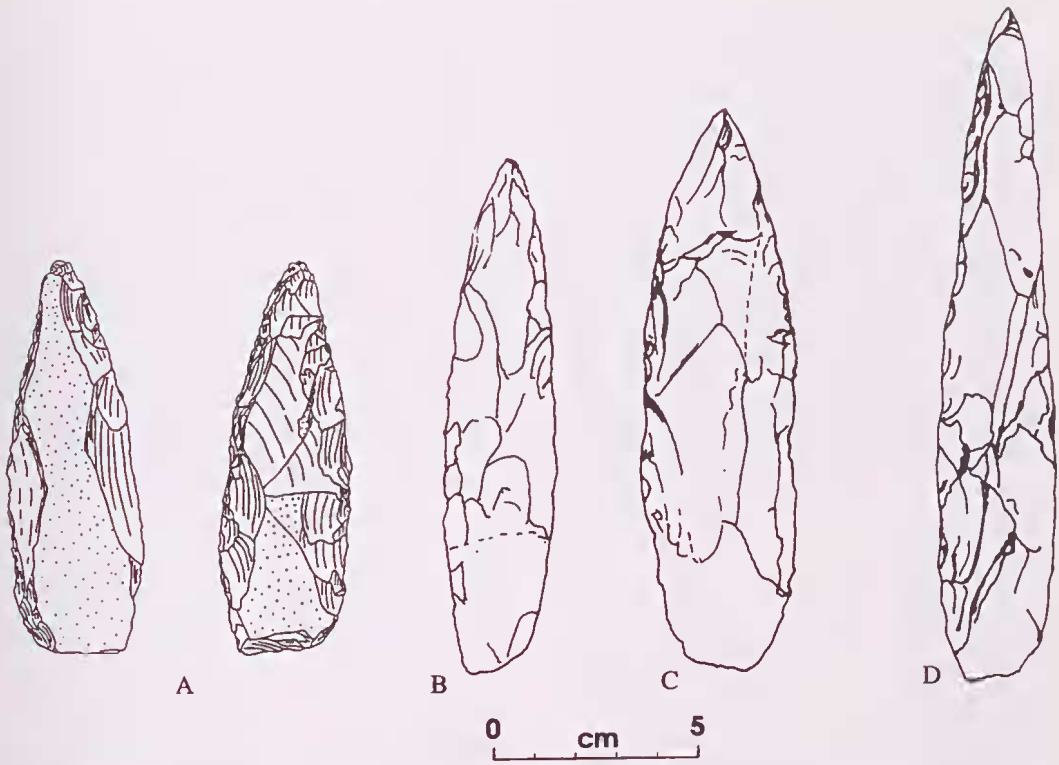

Fig. 2. Wanji Points. A, Pine Creek; B, Arnhem Land (after McCarthy 1976: Fig. 14 (No. 1)); C, Arnhem Land (after Dahl 1927: Plate 4 (No. 6)); D, Oenpelli, Arnhem Land (after McCarthy 1960: Plate 12 (No. 5)).

Northern Territory Triangular Points. This distinctive prehistoric biface point type occurs in south western Arnhem Land and adjacent areas. In plan, this point resembles an isosceles triangle with a width to length ratio of approximately 1:3. The base appears either straight or slightly curved and the remaining two margins are more or less straight (Fig. 3). These points commonly range from 40 - 90 mm in length. They are produced by carefully controlled, delicate percussion flaking, with minimal pressure flaking being undertaken to straighten the margins and form the tip. These points possess a more-or-less constant relationship between form and mass not observable in the other types of bifacial points discussed here. These points appear, however, to be prehistoric, there being no known ethnographic record or hafted examples existing.

Kimberley Points. The third form of point is manufactured using pressure technique on blanks prepared by percussion. Stone, glass and ceramic points of this type are found in the Kimberley and the area immediately to the east. It is this type of point which is usually referred to as the "Kimberley point".

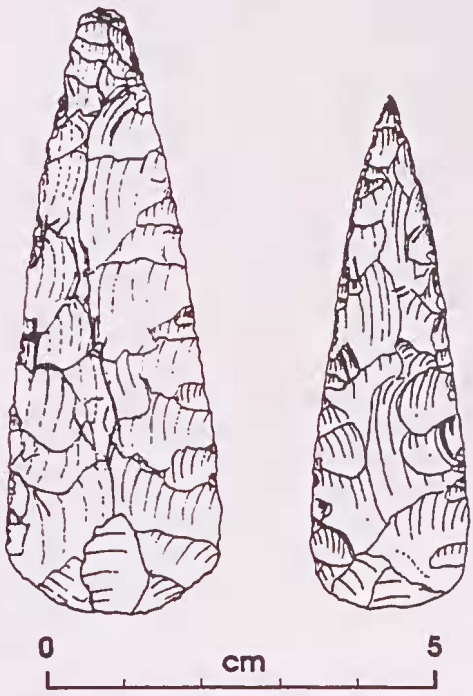

Fig. 3. Prehistoric biface points, central northern and northwestern Northern Territory.

Previously, the term 'Kimberley point' has been applied to what we consider to be a range of points, usually flaked bifacially, but not always by pressure flaking (McCarthy 1976: 42). Although some authors (White and O'Connell 1982: 122) restrict the term to those points bearing serrated edges, we consider that even this usage is unsatisfactory. There are two basic problems with the term Kimberley point as it has been used in earlier literature. Firstly, the name has been applied historically to more than one type of artefact. Within the Kimberley region itself, at least four types of bifacially flaked points can be distinguished on the basis of their margin treatments. Typologically it is unsatisfactory to describe these points with one all-embracing term. Secondly, although pressure-flaked biface points are common on Kimberley open sites and in excavations, there is no evidence as yet that pressure flaking of stone points originated in the Kimberley. As noted below, we believe that the likely dissemination centre for pressure flaking technology may lie much further east.

We suggest that the term Kimberley Point should only be used as a general term for biface points that are manufactured by pressure flaking. Pressure flaking proceeds from prepared platforms and each successive series of flakes is taken along one margin and refines half of each face alternately. The shape of Kimberley Points varies from ovate to lanceolate, with rounded bases and acuminate tips. Margins are invari-

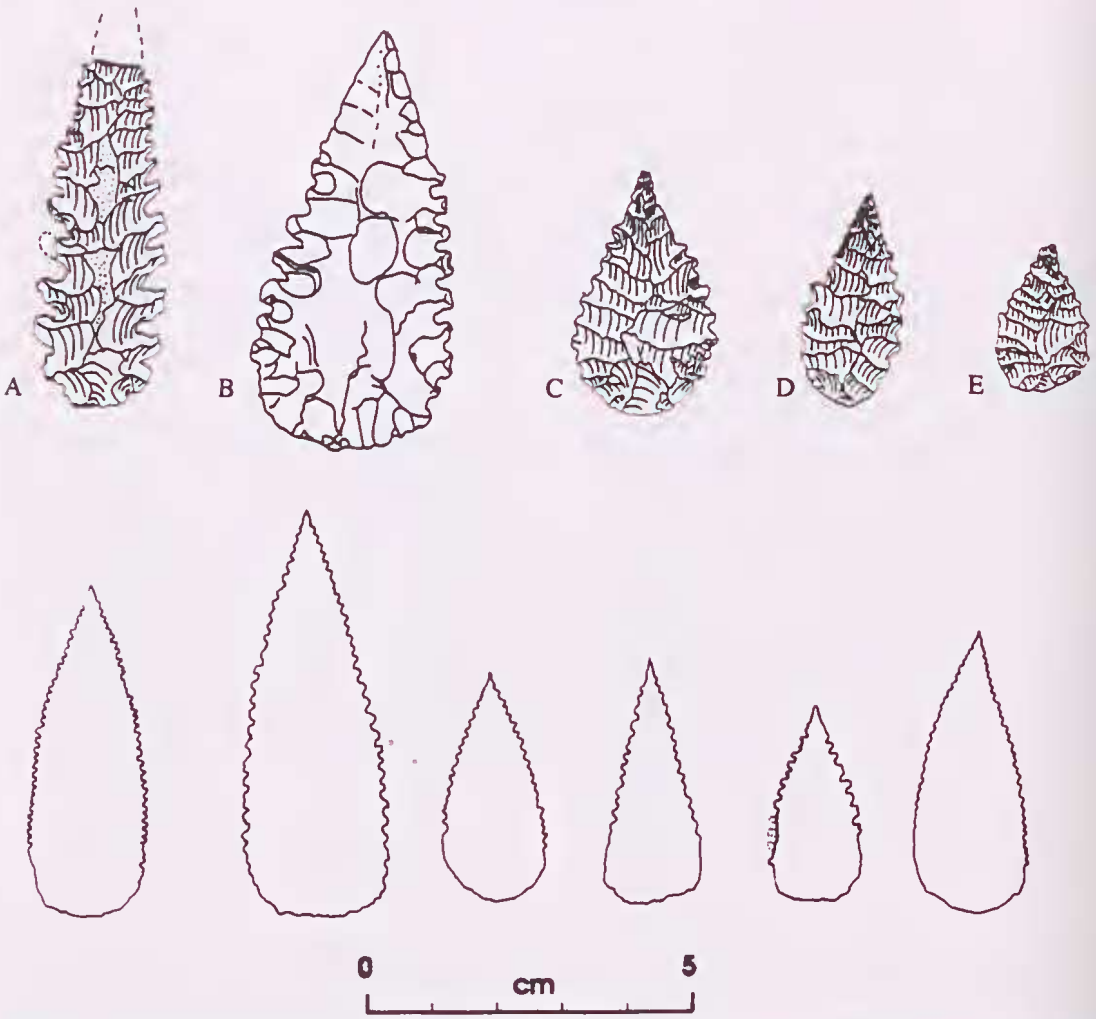

Fig. 4. Denticulate and serrated pressure flaked stone Kimberley Points. Top row: denticulate points. A, Lissadell Station; B, Halls Creek; C, Ningbing Station; D, Christmas Creek Station; E, Lamboo Station. Bottom row: outlines of serrated stone points from Kunmunya Mission.

ably either denticulate or serrate (Fig. 4).

Museum collections in Australia hold many examples of Kimberley Points derived from both ethnographic and archaeological sources. Broad examples produced from sections of glass bottles usually have relatively short scalar retouch on the concave face, while on narrow points the concavity may be obliterated. All known ethnographic examples have serrated and/or denticulate lateral margins. Some glass serrated points (Fig. 5) may have 6-8 teeth per 10 mm of margin, while denticulate stone points possess 2-3 teeth per 10 mm. In the Kimberley today, serration and denticulation of points does not imply or reflect any cultural differentiation, either spatially or temporally. Our observations of contemporary point manufacture demonstrate that both types of margin treatment may be utilised by any one Aboriginal knapper, and the output of a single craftsman usually includes points with both forms of margin treatment. No typological distinctions are drawn by contemporary Aboriginals between points with serrated or denticulated margins.

Love (1936: 74-75), Elkin (1948: 110-113) and Tindale (1985: 1-33) provided detailed descriptions of the manufacture of what are commonly called Kimberley Points. Such tools are illustrated in Figure 6. Pressure flaking of stone or glass points in the Kimberley today has become a lost art, although there are still a few people alive who knapped up to the mid 1980s but who are now aged and infirm. In addition, there are many Aboriginal people who, while not having practised the craft, have observed knappers in action in the recent past and can often provide information on the topic of lithic technology.

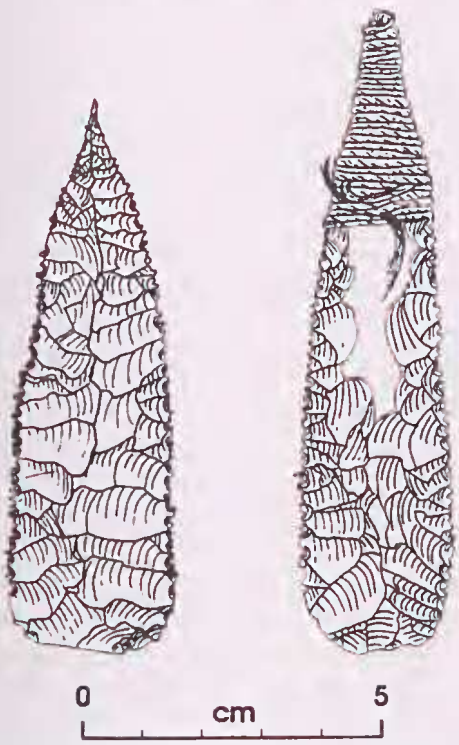

Fig. 5. Pressure flaked glass points with serrated margins, Kimberley, Western Australia. The point at right has the fine tip protected by cord wrapping.

A broad range of raw materials were exploited in the Kimberley for the production of ethnographic biface points. While some of these materials are widely available, others are more restricted in their distribution. Historically at Kunmunya, small (15-30 mm long) finely serrated points were generally made of translucent orange, white, yellow and red agates and chalcedonies that occur as small nodules in the basalt derived soils. Larger points from this area were made from silcretes and the opaque green to black cherts that occur throughout the Kimberley plateau. In the west Kimberley, high-grade quartz crystal was often used in the northern portions of the Napier Range and fossiliferous chert used in the southern parts. Variegated cherts were commonly used for points along the Ord Valley and the area immediately east of the Ord River. In the southern and south-eastern Kimberley, extensive outcrops of white chert were exploited as raw material. Across the Kimberley plateau and in the Ord River Basin, cobbles weathered from conglomerates provided a source of high-grade silcrete. To the east at Timber Creek, a distinctive grey merging to pink chert, derived from the Bardia Chert Member of the Skull Creek Formation, was used as raw material for the manufacture of both unifacially and bifacially flaked points. No doubt, with intensification of archaeological research in the north, further discrete and identifiable sources of raw material will be located.

Kimberley Dentate Points. There is however, a class of biface points that is quite different from those described above. Rather than being lanceolate in form with a rounded base and a short acuminate tip typical of the most recently made Kimberley biface points, these points are generally very narrow in relation to their length (Fig. 7). Adjacent to the rounded base and proceeding toward the pointed tip, the margin bears a series of large irregular teeth

separated by wide deep notches. Notching may extend for about half the overall length of the artefact, which then tapers more or less smoothly into a long drawn out tip. Teeth on opposite sides of each margin may be roughly aligned so that a degree of bilateral symmetry is maintained. As these points only occur in the Kimberley, it is proposed that they be called Kimberley Dentate Points.

Kimberley Dentate Points vary considerably in size. The largest examined is 115 mm long, with the majority ranging between 30 mm and 50 mm in length. Smaller points may have been used as projectile points, but the apparent fragility of larger examples suggests their use as prestige trade goods. The width/thickness ratio across the teeth is approximately 3.0, but only about 2.0 between the wide and deep notches. The length/width ratio varies between 4.0 and 5.0. Many of these points we have examined have lost the tip and the projecting teeth of others are damaged. Larger points that have apparently lost the tip, probably through accident rather than use, appear to have been subsequently rejuvenated by pressure flaking. Rather than creating a new elongate tip, which would require the removal of a substantial mass of material the distal edges have been brought to a simple ogival tip. Such a rejuvenated point is illustrated by Noone (1943: 244, Fig. 4).The toothed portion of the margins occupies approximately 0.3 to 0.6 of the overall length of the point. On the large points, the length of the dentate margin is proportionally greater than that area of a smaller point. The narrow parallel-sided tips are rhomboidal in section and relatively shorter in the larger points of this type than in the smaller examples.

Two manufacturing techniques were used to produce these points, depending on the size and shape of the available blanks. Large points were usually made on either thin tabular pieces or on large flakes of a range of silicified sedimentary rocks and tuffs. Some examples exhibit the remains of a primary ventral surface indicating that the blank was originally a flake. These pieces or flakes were reduced to preforms by percussion flaking. This reduced their width and thickness and ensured that a straight longitudinal profile was obtained. Pressure flaking was then used to notch the proximal margins to a depth of up to 6 mm, leaving the teeth between the notches standing clear. The notches may be up to 9 mm wide at the base and bear scars indicating that multiple flakes were removed from each face in the notching process. The projecting teeth are usually irregular in width and shape and create an overall illusion of complexity. In some instances the outer margins of the teeth are serrated. The inner side of each notch is roughly aligned with that of each adjacent notch and the teeth are set in balanced pairs on opposite margins so the greater mass of the artefact retains an elegant bilateral symmetry. Immediately in front of the most distal pair of notches, the point contracts relatively abruptly before extending to a long spike-like tip. The margins of the zone of contraction may be roughly denticulated while the tip bears even smooth edges.

The point is refined, prior to notching, by collateral pressure flaking undertaken on an anvil, and the invasive flakes removed are relatively short (7.0 mm). At the proximal section of the point, the pressure flaking does not obliterate the preforming percussion flake scars. At the narrower distal end and at the tip, the pressure flake scars meet at the midline creating the rhomboidal-sectioned tip.

Smaller Kimberley Dentate Points (< 50 mm long) are generally made directly on narrow, pointed flake-blades. The usual raw material is a white chert, common in the southern Kimberley; silicified tuff and a green, medium-grained chert may also be utilised. Although these points are bifacially worked, there is often no attempt to straighten the profile and the points may retain the curved longitudinal profile of the original flake-blade. The use of resin to haft spear points in the Kimberley allows even markedly curved points to be hafted with the axis of the point aligned with the shaft, minimising any effect the curvature would have either on the flight or penetration performance of the spear (Akerman 1978). Preforming by percussion is unusual and the notching and shaping of the proximal section may involve removal of a single series of flakes removed from both faces along each margin. Constriction of the tip requires the removal of several series of collateral flakes from each margin and face. Smaller points, made by first percussion preforming pieces of suitable material, resemble the larger examples except, as with all the smaller points, the length of the tip is proportionally longer in relation to the length of the dentate margin. The base of all

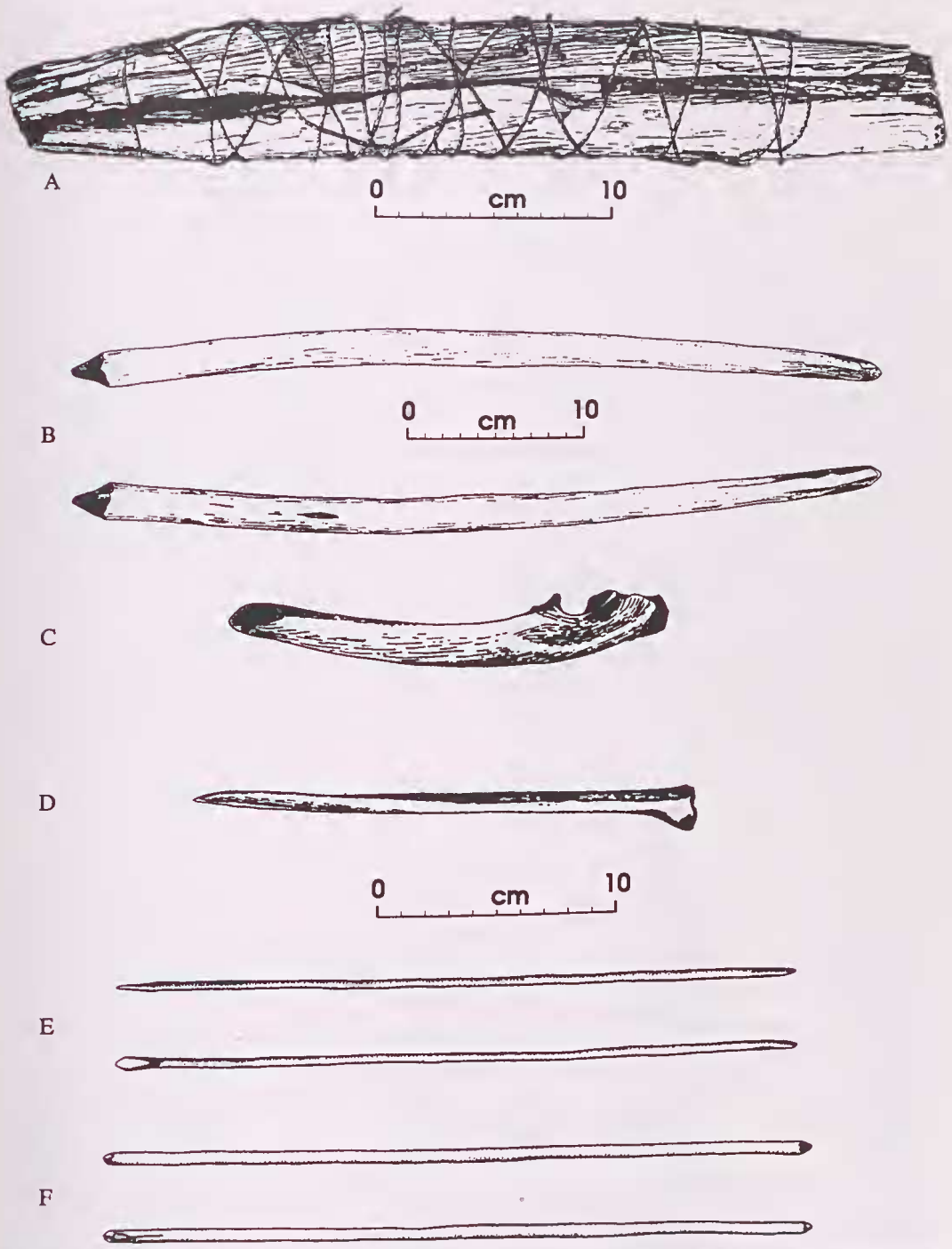

Fig. 6. Bark wallet and pressure flaking tools, Kunmunya Mission. **A**, cord wrapped bark wallet containing worked stone points and pressure flaking tools. Worora name *buru:ru* (Western Australian Museum (WAM 10093); **B**, hardwood indenter. Worora name *karindjalp;* **C**. kangaroo ulna indenter. Worora same *tjurmba* (WAM 10102); **D**, kangaroo fibula indenter, Worora name *tingkalja*. (WAM 10107); **E-F**, wire indenters.

examples, whether large or small, is rounded and reduced to the width of the body between the bases of the most proximal pair of notches.

For the Kimberley Dentate, form or shape appears to be determined on a cultural rather than a technological basis. It must however be recognised that by making these points on narrow flake-blades, the need for extensive pressure-flaking was minimised and there may have been recognised savings in both time and effort by prehistoric knappers at least in regard to the manufacture of the smaller dentate points. Generally, with regard to variation in the dimensions of Australian biface points, the raw material used or the technique of manufacture may, in some instances, determine the size range of points produced. The small agate points from the Kunmunya area and the slate Wanji biface points respectively, reflect such constraints.

Occurrence and distribution of Kimberley Dentate Points. While no points of this type have yet been recognised in a situation that would allow them to be placed into a chronological sequence, they do appear to have a definite spatial distribution in the Kimberley, being relatively common on open sites, particularly in the southern part of the Fitzroy River drainage basin. These open sites are of considerable interest, as the artefacts scattered upon them appear to be derived from industries generally regarded as discrete entities, reflecting cultural differentiation. Tula adze-flakes, core tools, edge-ground adzes and hatchet heads, pirri gravers, blades, unifacial and bifacial points as well as grinding and pounding stones and worked baler shell are all present at many of these sites. Such an aggregation is indicative of intense cultural interchange, with amalgamation of elements of northern, coastal and desert cultural suites. This combination forms a larger and more diversified industry than formerly existed either to the north or the south. The distribution of the edge-ground adze in the Kimberley as recorded by Akerman and Bindon (1984: 359) corresponds closely with that of the smaller dentate biface points.

To date, all the larger Kimberley Dentate Points have been isolated surface finds collected north of the Fitzroy River in the Napier Range, the Leopold Range and at Tablelands and Kurunjie Stations. Smaller examples (less than 50 mm in length) are only occasionally found north of the Fitzroy River. Apart from those observed in the Leopold Range, it appears that many of these larger points are traded items, an interpretation that is reinforced by their large size. This suggests that they may have served the same function as the contemporary large pressure-flaked points that are known ethnographically

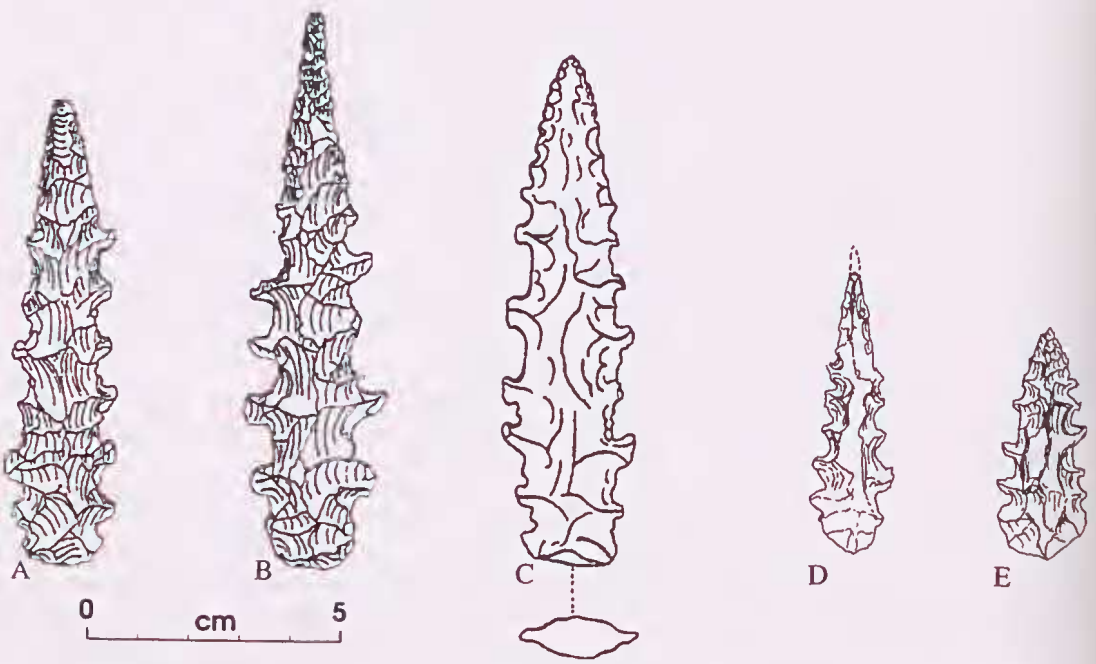

Fig. 7. Kimberley Dentate Points. **A**, Napier Downs, West Kimberley; **B**, Tablelands Station, East Kimberley; **C**, after Noone 1943: 244; **D**, Tablelands Station, East Kimberley; **E**, Bell Creek, West Kimberley. **C** and **E** have had the tips reworked.

Fig. 8. Pressure flaked point with denticulate and serrated margins (after King 1827: 68).

to represent prestige goods (Davidson 1935: 179-181). However, two points seen on a site adjacent to Bell Creek in the Leopold Range may have been manufactured locally. Both were made from blades of fine-grained green chert that was extensively exploited in this area for the manufacture of points and other implements. Freshly flaked surfaces of this chert exhibit a satin-lustre, whilst surfaces that have been exposed to the elements have a greasy or enamelled lustre that could be interpreted as evidence of heat treatment of the original material. However, examination of a fresh surface on a broken point revealed a satiny lustre, indicating that the glossy lustre of the surface of the artefact was a weathering phenomenon, and not the result of heat treatment.

Heat treatment of raw materials to enhance their flaking qualities seems only to have been practised in the southern portion of the area in which Kimberley Dentate Points are found. Consequently it is associated with the smaller examples, although not all of these have been subjected to this process. It should be noted, however, that although people of the north and central Kimberley who have made bifacially flaked spear points in the recent past talk about "cooking stones", they are usually referring to quarrying activities (Akerman 1979: 144-51). We have neither observed true heat treatment being practised nor found archaeological evidence for its occurrence in these northern areas. Information on heat treatment practices in this area can generally be regarded as unreliable and the techniques described by contemporary Aboriginal peoples are impractical, being more likely to destroy the raw material than enhance its flaking qualities. Historically, at least, it appears that heat treatment to modify and improve the flaking quality of raw materials was practised regularly only in the south and southeast Kimberley region.

DATING NORTHERN AUSTRALIAN POINT TECHNOLOGIES

Jones (1985: 296) suggested that the stone point technology in northern Australia originated in the Alligator Rivers region of west Arnhem Land between 5.7 and 6.2 kyr before the present. In the west Kimberley, invasively flaked bifacial points appear about 4.5 kyr BP (O'Connor 1990: 255) and 3.0 kyr BP in the east Kimberley (Dortch 1977:110). As O'Connor (1990: 208) points out, these dates "highlight the need for larger samples before we can be confident that our regional chronologies are firm". Bowdler and O'Connor (1991: 53-62) review the literature on dates of northern point industries and conclude that no sustainable date earlier than 4.5 kyr BP can be demonstrated. The manufacture and use of invasively flaked points persisted until relatively recently in the Kimberley, and in historic times the techniques of point manufacture began to diffuse eastwards (Davidson 1935: 1701-72).

In northern parts of the Northern Territory, judging from the ethnographic evidence, point industries based on the manufacture of elongated flakes and pointed blades supersede bifacially flaked point industries in the recent past. Hafted examples of the latter type, apart from Wanji Bifaces, are rare in museum collections except those from the western periphery, around about the lower Victoria River basin,

where an overlap in point technologies appears to have persisted until recently. Our own observations of point numbers on surface sites suggest that, in the past, there was a richer point industry in this region of overlap, as evidenced by the presence of greater proportions of both bifacially and unifacially flaked points within the stone artefact assemblages, than can be observed in those assemblages scattered on open sites located in the Kimberley. In this latter area, bifacially flaked point technology replaced a pointed flake/blade technology and was then refined to a degree not found in the Northern Territory. McCarthy (1976: 44) and White and O'Connell (1982: 112) suggest that this refinement is a post-contact response to an external demand for curios in combination with the availability of new, easily worked, vitreous raw materials such as glass and porcelain. However, it is clear from the literature that Kimberley biface points at contact were as refined as those produced at later dates. King (1827: 68) illustrates a denticulate biface point approximately 150 mm long, that is as skilfully and as regularly flaked as any point of stone or glass manufactured subsequent to contact (Fig. 8). A photograph of this point appears in the British Museum Handbook to the Ethnographic Collections (1910: plate V (a)); although the extreme tip is now missing, the very regular dentate and denticulated margins and the flake scars conform with those seen in King's sketch. As Etheridge (1890: 63-4) notes, this point has "more or less square-headed teeth, themselves at times serrated, and separated by interspaces equal to themselves in breadth" rather than the sharply serrated margins that he observed on points collected in the East Kimberley.

CONCLUSION

Bifacially pressure-flaked points are still produced occasionally within the Aboriginal communities in the Kimberley. Familiarity with the technology of their production is now confined to a dwindling few practitioners. Modern points are usually leaf-shaped, made of glass, and exhibit denticulate or serrated edges. These are rarely, if ever, used as spear armatures. Instead they function as trade goods and souvenirs, much as, we suggest, did the larger Kimberley Dentate Point in earlier times. To determine their suitability as cultural and temporal markers, the various kinds of bifacially flaked points occurring in the Kimberley must be recovered in many more stratigraphically controlled and dated situations. Until then, these descriptions and the typology presented should be seen as a first step in separating and documenting some of the various production techniques and the resultant artefacts in the general class of tools known as 'points'.

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